Algebra 1-2

Name ANSWER KEY ID: 1

3.7 Absolute Value Equations

Date _____ Period ____

Solve each equation. MAKE SURE TO SHOW YOUR WORK!!!

1) $|-5n| = 40$

A) $\{21, -21\}$ B) No solution.
C) $\{12, -12\}$ D) $\{-8, 8\}$

$\frac{-5n}{-5} = \frac{40}{-5}$ or $\frac{-5n}{-5} = \frac{-40}{-5}$

$n = -8$ or $n = 8$

$\{-8, 8\}$

2) $\left|\frac{x}{8}\right| = 4$

A) $\{16\}$ B) $\{32, -32\}$
C) $\{32\}$ D) $\{16, -16\}$

$\left|\frac{x}{8}\right| = 4$

$8\left(\frac{x}{8}\right) = (4)(8)$ or $(8)\left(\frac{x}{8}\right) = (-4)(8)$

$x = 32$ or $x = -32$

$\{32, -32\}$

3) $|-5n| = 0$

A) $\{9\}$ B) $\{7, 3\}$
C) $\{0\}$ D) $\{9, -9\}$

$|-5n| = 0$

$\frac{-5n}{-5} = \frac{0}{-5}$ or $\frac{-5n}{-5} = \frac{0}{-5}$

$n = 0$ or $n = 0$

4) $|3k| = 6$

A) $\{4, -4\}$ B) $\{2\}$
C) $\{36, -36\}$ D) $\{2, -2\}$

$|3k| = 6$

$\frac{3k}{3} = \frac{6}{3}$ or $\frac{3k}{3} = \frac{-6}{3}$

$k = 2$ or $k = -2$

$\{2, -2\}$

5) $|x + 8| = 4$

A) $\{-4, -12\}$ B) $\{18, -2\}$
C) $\{5, -3\}$ D) $\{5\}$

$|x + 8| = 4$

$x + 8 = 4$ or $x + 8 = -4$

$-8 \quad -8 \qquad -8 \quad -8$

$x = -4$ or $x = -12$

$\{-4, -12\}$

6) $|2x - 5| = 15$

A) $\left\{3, -\frac{25}{3}\right\}$ B) $\left\{-10, \frac{29}{3}\right\}$
C) $\{3\}$ D) $\{10, -5\}$

$|2x - 5| = 15$

$2x - 5 = 15$ or $2x - 5 = -15$

$+5 \quad +5 \qquad +5 \quad +5$

$\frac{2x}{2} = \frac{20}{2} \qquad \frac{2x}{2} = \frac{-10}{2}$

$x = 10$ or $x = -5$

$\{10, -5\}$

7) $|5-3v|=10$

A) $\left\{-\frac{5}{3}, 5\right\}$ B) $\left\{\frac{26}{9}, -4\right\}$

C) $\left\{\frac{26}{9}\right\}$ D) $\{5, -9\}$

$|5-3v|=10$

$5-3v=10$ or $5-3v=-10$

$-5 \quad -5 \qquad -5 \quad -5$

$-3v=5 \qquad -3v=-15$

$-3 \quad -3 \qquad -3 \quad -3$

$v=-\frac{5}{3}$ or $v=5$

$\left\{-\frac{5}{3}, 5\right\}$

8) $|-9x-3|=33$

A) $\{0\}$ B) $\left\{-4, \frac{10}{3}\right\}$

C) $\{0, -2\}$ D) $\{-4\}$

$|-9x-3|=33$

$-9x-3=33$ or $-9x-3=-33$

$+3 \quad +3 \qquad +3 \quad +3$

$-9x=36 \qquad -9x=-30$

$-9 \quad -9 \qquad -9 \quad -9$

$x=-4$ or $x=\frac{10}{3}$

$\left\{-4, \frac{10}{3}\right\}$

9) $\frac{|3p|}{7}=5$

A) $\left\{\frac{35}{3}\right\}$ B) $\{-3, 3\}$

C) $\left\{\frac{35}{3}, -\frac{35}{3}\right\}$ D) $\{5, -5\}$

$7\left(\frac{|3p|}{7}\right)=(5)(7)$

$|3p|=35$

$3p=35$ or $3p=-35$

$\frac{3p}{3}=\frac{35}{3} \qquad \frac{3p}{3}=\frac{-35}{3}$

$p=\frac{35}{3}$ or $p=\frac{-35}{3}$ $\left\{\frac{35}{3}, \frac{-35}{3}\right\}$

10) $1+|-10m|=61$

A) $\{-3, 3\}$ B) $\{8, 0\}$

C) $\{-6, 6\}$ D) $\{7, -7\}$

$1+|-10m|=61$

$-1 \quad -1$

$|-10m|=60$

$-10m=60$ or $-10m=-60$

$-10 \quad -10 \qquad -10 \quad -10$

$m=-6$ or $m=6$

$\{-6, 6\}$

11) $\frac{|4+n|}{2}=2$

A) $\{0\}$ B) $\{10, -4\}$

C) $\{0, -8\}$ D) $\{-1, 1\}$

$(2)\left(\frac{|4+n|}{2}\right)=(2)(2)$

$|4+n|=4$

$4+n=4$ or $4+n=-4$

$-4 \quad -4 \qquad -4 \quad -4$

$n=0$ or $n=-8$

$\{0, -8\}$

12) $2\left|\frac{x}{3}\right|-6=-2$

A) $\{7, -7\}$ B) $\{6, -6\}$

C) $\{9, -9\}$ D) $\{3, 1\}$

$2\left|\frac{x}{3}\right|-6=-2$

$+6 \quad +6$

$\frac{2\left|\frac{x}{3}\right|}{2}=\frac{4}{2}$

$\left|\frac{x}{3}\right|=2$

$(3)\left(\frac{x}{3}\right)=(2)(3)$ or $(3)\left(\frac{x}{3}\right)=(-2)(3)$

$x=6$ or $x=-6$

$\{6, -6\}$

13) $-4+10|k-6|=6$

A) $\{7, 5\}$ B) $\{27, -7\}$

C) $\{-1, 1\}$ D) $\{27\}$

$+4 \quad +4$

$\frac{10|k-6|}{10}=\frac{10}{10}$

$|k-6|=1$

$|k-6|=1$

$k-6=1$ or $k-6=-1$

$+6 \quad +6 \qquad +6 \quad +6$

$k=7$ or $k=5$

$\{7, 5\}$

14) $7|-5+p|-5=2$

A) $\{-3, -15\}$ B) $\{7, 5\}$

C) $\{-3\}$ D) $\{6, 4\}$

$+5 \quad +5$

$\frac{7|-5+p|}{7}=\frac{7}{7}$

$|-5+p|=1$

$-5+p=1$ OR $-5+p=-1$

$+5 \quad +5 \qquad +5 \quad +5$

$p=6$ or $p=4$

$\{6, 4\}$